



Evaluating the Impact of Social Media on Consumers' Online Shopping Behavior: A Mediated-Moderation Model

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Abstract

Social commerce has rapidly become a new field of study for both professionals and academics, indicating the possible influence of social media in shaping online commercial avenues. People spend a significant amount of time on social media, presenting online businesses with the chance to gain a comprehensive understanding of their customers' shopping behaviors. Consequently, it is essential to explore the factors that affect consumers' online shopping behavior. This research, conducted in Indonesia, seeks to identify the factors influencing consumer online shopping behavior. Analyzing data from 375 customers, the study employs Smart PLS to explore the relationships within the proposed model. The results indicated that live streaming, promotional tools, celebrity endorsements and perceived credibility are factors that impact consumer online shopping behavior in social commerce. The study verified the mediating role of promotional tools. However, perceived credibility did not moderate the association amid promotional tools and consumer online shopping behavior. The findings offer clearer insights into the factors affecting consumer online shopping behavior, aiding entrepreneurs in developing more effective strategies. This research brings fresh perspectives on consumer online shopping behavior by examining it empirically within the Indonesian context. This is significant due to the previous lack of studies focused on consumer behavior in social commerce and the scarcity of empirical evidence in this area.

Keywords: *Social Commerce; Online Shopping Behavior; Promotional Tools; Credibility; Celebrity Endorsement*

1. Introduction

Today, social media significantly impacts the online marketing landscape, facilitating product purchases from online stores over traditional brick-and-mortar stores through internet connectivity (Mahoney & Tang, 2024). The trend of social media is quite recent. Popular social networking sites like Instagram, Twitter, and Facebook rule over activities like blogging, gambling, and texting (Murari et al., 2024). Consumers are often highly active on social media, spending extensive hours on platforms like Facebook and Twitter to create and share content (Miah et al., 2022). Companies recognizing this trend are engaging in various activities to attract customers, raise awareness, and capitalize on social media opportunities. As a result, firms run strategic campaigns aligned with consumers' demographics and brand values to boost social brand recognition. Digital and social media marketing enable companies to achieve their marketing objectives at a relatively low cost (Deb et al., 2024).

Today, global purchasing patterns are shifting, with customers increasingly buying goods and services online. Social media has significantly influenced this trend (Al Kurdi et al., 2024). During the COVID-19 pandemic, lockdowns, isolation, and fears of contracting the virus led to a decline in visits to shopping malls (Eger et al., 2021). Businesses can encourage customers to shop online through social media platforms like Facebook, Twitter, Instagram, and Pinterest. Marketers benefit greatly from social media as it allows them to influence customer awareness and motivate online purchases. Business entities can influence current and new consumers to buy their essential items via e-stores or digital marketplaces by using social media platforms (Chaturvedi & Gupta, 2014). Organizations have wielded influence over customers through live streaming, endorsements by celebrities, and promotional tools for targeted advertising (Schouten et al., 2021; Geng et al., 2020). Additionally, the credibility of influencers has played a role in persuading potential customers to engage in online shopping (Tuncer & Kartal, 2024). It is crucial for both businesses and marketers to comprehend consumers' preferences, attitudes, and behaviors regarding online shopping (Moinuddin et al., 2024).

In contemporary society, some customers lead such hectic lives that they lack the time to physically shop for essential products or services. Consequently, they opt for online shopping as it offers convenience and saves time. Presently, customers seek a stress-free shopping experience on social media platforms. Marketers utilize targeted advertising on platforms such as Facebook and Twitter (Moedeen et al., 2024), making traditional marketing communication strategies less effective than social media marketing tools. Celebrity endorsements contribute to word-of-mouth promotion, further encouraging online shopping among customers. Indonesia, boasting a population exceeding 265 million, ranks among the world's largest online markets (Statista, 2024a). The e-commerce market in Indonesia is projected to continue growing, with the number of users expected to reach 99.1 million by 2029. There has been a consistent increase in e-commerce users in recent years (Statista, 2024b). Additionally, Indonesia's e-commerce revenue is anticipated to grow significantly, potentially reaching US\$120 billion by next year. In 2022, 69% of Indonesian consumers participated in livestream commerce, but the industry faces regulatory challenges, such as the Indonesian government's ban on direct transactions on social media platforms like TikTok Shop, which could impact social commerce (Uzunoglu, 2024). Therefore, it is crucial to assess the influence of social media marketing on consumer online shopping behavior in contemporary times. Consequently, this study aims to investigate the following question within the context of Indonesia: what factors, in specific, influence consumer online shopping behavior to social media marketing?

This study explores the factors influencing purchasing behavior on social media, an increasingly compelling topic for researchers worldwide as consumer buying patterns evolve. Social media has experienced rapid development in recent years, but there is a lack of research on this subject in developing countries, especially in the realm of social commerce (Jamil et al., 2022). Indonesia boasts a large number of social media users who prefer online shopping, yet there is limited literature regarding

the current influence of social media on internet purchasing trends. Therefore, this research aims to identify the areas of greatest influence on consumer online buying behavior for marketers. Understanding the purchasing behavior of online shoppers in Indonesia is crucial in this context.

After reviewing the existing literature regarding impact of social media on internet buying, it is limpid that numerous studies have attempted to examine the ways in which social media components, such as live streaming, celebrity endorsements, electronic word-of-mouth, and promotional tools, impact different facets of consumer satisfaction, online shopping behavior, and purchase intention worldwide, especially during the COVID-19 pandemic. However, this study aims to look into how social media affects consumers' online buying behavior in the post-COVID-19 era specifically from the perspective of Indonesia, which remains an underexplored area. By focusing on the experiences of prominent Indonesian buyers and sellers, this research sheds light on the recent impact of live streaming, promotional tools and celebrity endorsements, on online shopping behavior. These insights will assist policymakers and stakeholders in devising more effective digital marketing strategies in Indonesia, while also contributing to the post-COVID-19 research landscape in this field.

The main goal of this research is to examine how social media affects the online shopping behavior of Indonesian consumers in the post-COVID-19 era. Specific objectives include analyzing the purchasing patterns of Indonesian consumers on online platforms and investigating how live streaming, promotional tools and celebrity endorsements impact their online shopping behavior.

This study makes several significant contributions to the literature on social commerce. First, it seeks to understand the factors influencing consumer online shopping behavior in a developing economy post-COVID-19, specifically in Indonesia. This fills a gap in the literature regarding the influence of social media on consumer online shopping behavior, which has received limited attention despite its increasing popularity among users. Second, previous research (e.g., Iqbal et al., 2024) has suggested exploring the role of moderators that could influence consumer online shopping behavior. Additionally, there has been limited research on the perceived credibility of influencers in the realm of live streaming social commerce (e.g., Gu et al., 2024). Research on the function of social media promotional tools as a mediator in the relationship between determinants like live streaming and celebrity endorsements, and consumer online shopping behavior, is also scarce. Addressing these gaps, the secondary objective of this study is to investigate how social media promotional tools act as a mediator, stimulating consumer online shopping behavior within the context of social commerce. Third, by incorporating new variables into Social Influential Theory, this study extends the theory. Lastly, by examining the impact of promotional tools and perceived credibility, this research aims to assist marketers in creating more targeted campaigns to encourage consumer repurchase.

The organization of this study is outlined as follows: Section 2 presents the research background and develops hypotheses. Section 3 illustrates the methodology. Section 4 presents the results and data analysis. Section 5 provides the discussion and conclusion. The implications and limitations of the study are discussed in the final two sections.

2. Research Background and Hypotheses Development

A unique form of e-commerce known as "social commerce" incorporates social media interactions into the purchasing and selling process and places an emphasis on community-centric techniques (Nadeem et al., 2020; Huwaida et al., 2024). A key idea in contemporary e-commerce is consumer online buying behaviour, which describes the act of making purchases online of goods or services (Islam, 2015). Numerous factors, like live streaming and celebrity endorsements, have an impact on this behaviour. These elements also change customer behaviour by establishing trust and shaping perceptions. Intentions and trust are significantly shaped by post-purchase experiences as well

(Asanprakit & Kraiwanit, 2023). The decision-making process of consumers is greatly influenced by social influence, consumer engagement, and trust in these platforms. Moreover, social media quick development of features, such as integrated shopping and influencer marketing, has added more complexity to this field (Hajli, 2015). Consequently, social commerce not only reflects prevailing trends in consumer online shopping behavior but also acts as a harbinger of future directions in e-commerce, underscoring its importance as a focal point in modern market research.

In Indonesia, there is a notable rise in social commerce, with a considerable portion of Indonesian consumers showing a preference for shopping through social media platforms. According to a survey conducted in 2022, a considerable proportion of Indonesian respondents expressed their plan to make future purchases using social media platforms, indicating the growing popularity of social commerce in the nation (Nurhayati, 2024). Furthermore, a review of the impacts of social commerce adoption in Indonesia highlighted that it is crucial to comprehend consumer purchasing intentions in order to formulate effective social commerce platform strategies (Saghfira & Astuti, 2022).

Several studies have employed established theories to elucidate consumer online shopping behavior. While previous research has identified numerous factors influencing online consumer behavior, encompassing all potential factors within a single research model is nearly impossible. Most studies have concentrated on a select few significant factors. For instance, Koufaris (2002) investigated factors derived from information systems (such as the technology acceptance model), marketing (Consumer Behavior), and psychology (Flow and Environmental Psychology) within a unified model. Pavlou and Fygenon (2006) explored consumers' adoption of e-commerce using the extended theory of planned behavior (TPB) (Ajzen, 1991). Miah et al. (2022) applied the social influential theory, social exchange theory, and information processing theory to assess the influence of social media influencer marketing on consumer online shopping behavior. The present study employs Social Influential Theory (SIT) to elucidate the connections between live streaming, celebrity endorsements, and consumer online shopping behavior. As per Kelman (1958), Social Influential Theory (SIT) delineates how individuals' beliefs, attitudes, and subsequent behaviors are influenced by others through three processes: compliance, identification, and internalization. Persuasion typically occurs when individuals are influenced and adopt the persuaded behavior to reap rewards or avoid punishments. Thus, satisfaction stemming from compliance arises due to the social impact of yielding to influence. Identification occurs when individuals accept opinions with the aim of establishing or maintaining a desirable and beneficial relationship with others or a group. Internalization occurs when individuals are influenced and subsequently realize that adopting the persuaded behavior leads to gratification, thereby aligning their attitudes and actions with those of others. Influencers serve as intermediaries who significantly shape the opinions, preferences, and actions of a company's customers. Anyone can be an influencer by encouraging consumers to buy products and services from a business (Gillin, 2007). Besides, word-of-mouth marketing impacts consumers through information shared between individuals, while the behavior of celebrities influences consumers through their endorsement of a business (Sernovitz et al., 2012).

In recent times, online shopping has witnessed a surge in popularity globally, appealing to both consumers and retailers alike. Both online retailers and consumers can benefit from online shopping (Hagen et al., 2024). Consumer behavior studies indicate that online reviews and specific opinions sharing have become highly significant forms of communication. Presently, many customers are making purchases through social media platforms. Numerous businesses have chosen to leverage the opportunities offered by social media networks to attract more consumers (van der Harst & Angelopoulos, 2024). Live streaming content serves as stimuli that prompt cognitive states in consumers, ultimately affecting their behavior to purchase online (Xu et al., 2020). Moreover, business entities have increasingly turned to social media advertising to entice online buyers into making purchases (Mumtaz et al., 2011). Furthermore, targeted advertising on social media platforms such as Facebook and Instagram is gaining popularity, allowing businesses to gain insights into customers' preferences and tailor e-

advertising accordingly. By leveraging this data, organizations can customize advertising campaigns to target specific customer segments and set desired pricing strategies (Iyer et al., 2005). Through online advertising, retailers can disseminate information regarding their products, enabling consumers to vividly engage with their preferred items. Additionally, entrepreneurs utilize celebrity endorsements to promote their products, which can enhance consumer purchase intentions. The endorsement of products by celebrities may shape consumers' perceptions of the products, influencing their purchase decisions (Wang et al., 2013).

Moreover, various factors influence consumer online shopping behavior, including social media marketing through promotional tools (Miah et al., 2022) and perceived credibility (Kim & Song, 2020). Research has identified credibility as a dimension of trust (Doney and Cannon, 1997), defined as the degree to which a recipient finds information believable (Wathen and Burkell, 2002). Electronic marketing tools are employed by online businesses to develop advertising campaigns, marketing tactics, and consumer purchasing behaviour by means of prospective market segmentation. Eyre et al. (2020) defined that internet advertising can take many different forms, but some examples include social network advertising, banner ads, rich media ads, contextual ads, online classified ads, and marketing emails. Advertising is the process of using media to communicate a personal meaning associated with facts and product concepts in order to establish a brand identity (Kotler & Armstrong, 2010). Certainly, as a developing country, Indonesia holds substantial potential for online businesses. Indonesia ranks among the countries with the highest use of social media. Therefore, understanding the factors driving online buying behavior on social media is crucial. However, there is a lack of previous research on consumer online shopping behavior in the context of social media influencer marketing in Indonesia, particularly in the post-COVID-19 era. Additionally, prior studies have not thoroughly examined the factors impacting consumer online shopping behavior in the context of social media influencer marketing, nor have they explored how social media promotional tools function as mediators and perceived credibility acts as moderators alongside Social Influential Theory (SIT). Figure 1 illustrates the factors influencing consumer online shopping behavior, with promotional tools acting as mediators and perceived credibility as moderators. The following subsections detail the study variables and formulate hypotheses based on the existing literature.

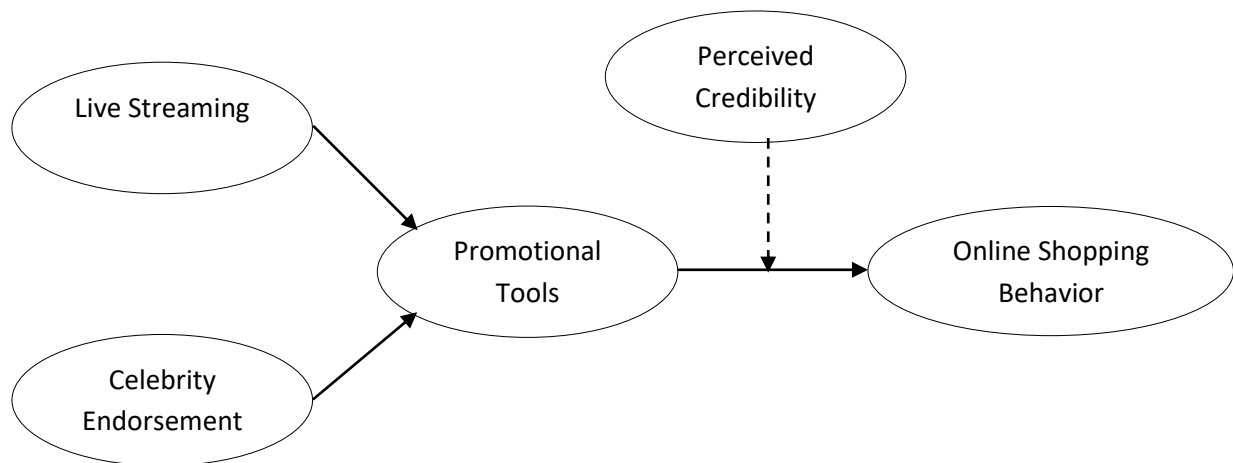


Figure 1 Research Model

2.1 Live Streaming

Live streaming shopping is an innovative form of social commerce adopted and utilized by social commerce vendors (Miah et al., 2022). Through live presentations, retailers can influence online customers to make purchases. Live streaming has revolutionized the traditional social commerce model in

several ways. Online retailers can display real-time videos of their items thanks to live streaming, in contrast to traditional online shopping, where buyers can only learn about products and services through text and photographs. Customers can use this to learn more about the general characteristics and calibre of the merchandise (Wongkitrungrueng & Assarut, 2018). Social Influential Theory explains that people are influenced by others through three processes that lead to changes in their beliefs, attitudes, and behaviour: internalisation, identification, and compliance. According to Zhang et al. (2019), implementing a live streaming strategy can enhance a buyer's intention to make online purchases by diminishing psychological distance and perceived uncertainty. In order to increase client trust and increase the likelihood that they will watch and buy, Chandruangphen et al. (2022) recommend that merchants concentrate on important aspects of live streaming. Studies and literature indicate that live presentations enable vendors to exhibit their goods in a unique way, which may improve buyers' opinions and feelings about the item. Consequently, customers may develop greater confidence in the seller and their products due to live streaming. Thus, this study posits the following:

Hypothesis 1a: Live streaming significantly influences the use of promotional tools.

Hypothesis 1b: Live streaming significantly influences consumer online shopping behavior.

2.2 Celebrity Endorsement

A celebrity can effectively influence consumer purchasing decisions due to the trust people place in well-known figures. Through social media, celebrities can raise awareness about products and have a positive effect on customers' perceptions of a particular brand (Rai & Sharma, 2013). Moreover, celebrity endorsement is a marketing tactic used to draw attention to particular goods. An integrated model of online celebrity endorsement has been designed and evaluated by Park and Lin (2020), who also looked into the compatibility effects on consumers. Meng et al. (2021) have found that audience sentiments toward online celebrities may impact a shoppers' inclination to purchase goods recommended by these influencers. Prior literature elucidates that celebrity endorsements, characterized by attractiveness, credibility, and compatibility between the celebrity and the goods, positively influence a shoppers' attitudes toward brands and goods, and buying intentions. Consequently, celebrity endorsements can enhance consumers' desire to purchase products. Building on the above discussion, following hypotheses are proposed:

Hypothesis 2a: Celebrity endorsement significantly influences the use of promotional tools.

Hypothesis 2b: Celebrity endorsement significantly influences consumer online shopping behavior.

2.3 Promotional Tools

Online firms utilize digital marketing technologies to develop marketing strategies, advertising campaigns, and insights into potential market segmentation in order to understand customer purchasing behaviour. Eyre et al. (2020), asserted that online advertising encompasses marketing emails, social network advertising, banner ads, rich media ads, contextual ads, and online classified ads. In order to boost engagement and encourage online purchase, businesses should work to increase the number of favourable online reviews that consumers provide (Nuseir, 2019; Ventre and Kolbe, 2020). Detailed product information in reviews increases their credibility among consumers (Jiménez & Mendoza, 2013). Prior literature has emphasized that peer ratings and customer opinions have a significant impact on internet purchase behavior. Consequently, favourable online reviews draw in more customers and have a beneficial impact on their purchase decisions.

Furthermore, prior studies have explored the use of promotional tools as mediators in various contexts. For example, Asadollahi et al. (2020) conducted a study in Iran and found a significant

relationship between brand identity transfer and sport commitment and their dimensions, mediated by promotional and advertising tools. Additionally, Nuseir & Al Shawabkeh (2019) investigated the mediating role of Facebook as a platform for facilitating advertising to its users and observed that it dynamically meets the growing needs of its users. Hence the current study proposes that:

Hypothesis 3: Promotional tools significantly influence consumer online shopping behavior.

Hypothesis 4: Promotional tools significantly mediate the relationship between live streaming and consumer online shopping behavior.

Hypothesis 5: Promotional tools significantly mediate the relationship between celebrity endorsement and consumer online shopping behavior.

2.4 Perceived Credibility

One of the most important factors influencing purchasing decisions is perceived credibility (Kim and Song, 2020). The concept of source credibility is the foundation of credibility and refers to the degree of confidence an information recipient has in the objectivity and impartiality of the source (Wang and Yang, 2010). In contrast to characteristics like pricing and quality, which can be evaluated through customer use, credibility is developed via faith in a company (Atkinson and Rosenthal, 2014). Customers use credibility and trust as short cuts when choosing a firm over another, particularly in the e-commerce space (Koh & Sundar, 2010).

Furthermore, Shah and Oppenheimer (2008) stated that when faced with a multitude of cues throughout the decision-making process, consumers typically simplify their approach by concentrating on a smaller number of indications. Individuals are prone to relying on information that is more obvious (Tversky and Kahneman, 1974). This suggests that consumers analyse information that is readily accessible differently based on how credible they believe it to be (Grewal et al., 1994). Customers might not actively look for more cues to make a decision if information they consider to be highly reliable is prominent and reduces consumer uncertainty (Jeong & Jang, 2017; Kim & Song, 2020). Research suggests that in some situations when there is readily available salient information, buyers are less likely to take into account other indicators, including customer reviews. In contrast, consumers may look for extra cues to reduce the risks involved in making decisions when perceived credibility is low (Shiu et al., 2011).

Previous studies have shown that consumers' purchasing behaviour is positively influenced when they feel a connection to the endorser (Daneshvary and Schwer, 2000). The concept of parasocial identification was first presented by Shan et al. (2020). It posits that even though followers do not know influencers personally, they nevertheless feel a parasocial relation to them, and that a high level of self-influencer congruence increases followers' parasocial identification with the social media influencer. Previous research has highlighted that in order to produce positive brand results, there needs to be a strong alignment between the influencer and the brand (Hudders et al., 2021). Influencers also profit from the trust and established ties they have built with their followers (Kim & Kim, 2021). Influencers who are seen as being like their followers are often seen as more credible, which increases the intention to buy the endorsed product (Sokolova and Kefi, 2020). In the context of consumer food purchasing behaviour, recent research (e.g., Kim et al., 2024) has investigated and validated the moderating influence of perceived credibility. Therefore, it is assumed that:

Hypothesis 6: Perceived credibility significantly influences consumer online shopping behavior.

Hypothesis 7: Perceived credibility significantly moderates the relationship between promotional tools and consumer online shopping behavior.

3. Methodology

3.1 Measurement and Data Collection

Researchers emphasize the importance of employing appropriate analytical techniques to achieve research objectives and address theoretical and practical issues (Rehman et al., 2019). Hence, this study adopts a quantitative approach using a structured questionnaire for data collection and hypothesis testing (Rehman et al., 2019). Respondents were presented with a five-point Likert scale to indicate their responses to survey questions. The indicators for the study constructs were derived from the existing literature as follows:

Section A of the questionnaire encompasses the independent variables, including live streaming and celebrity endorsement. This section also includes questions related to the mediator, moderator, and dependent variables: promotional tools, perceived credibility, and consumer online shopping behavior, respectively. All items pertaining to each construct, sourced from previous research, were assessed using a 5-point Likert scale ranging from strongly disagree (1) to strongly agree (5). The measurement scale for live streaming was adapted from Xu et al. (2020), while the scale for celebrity endorsement was derived from Zafar et al. (2021). The measurement scale for promotional tools was adopted from Bakewell and Mitchell (2003), and perceived credibility was measured using the scale developed by Appelman and Sundar (2016). The scale for consumer online shopping behavior was adapted from Masoud (2013). Additionally, Section B addresses demographic profiles and the frequency of online shopping.

The current study focuses on Indonesian consumers who engage in online shopping. Purposive sampling followed by snowball sampling was utilized for participant selection. Questionnaires were distributed to respondents online. Previous research recommends combining snowball sampling with purposive sampling techniques for data collection (e.g., Valerio et al., 2016; Ritchie et al., 2013), particularly in situations where defining the sampling frame is challenging. Consequently, the survey link was shared with individuals who engage in online shopping in Indonesia. To maximize the number of responses within a short timeframe, the online questionnaire was disseminated through various platforms such as Messenger, Instagram, and WhatsApp. The survey link was available for responses from the beginning to the end of November 2023. A total of 375 out of 392 received responses were deemed valid for analysis.

3.2 Statistical Technique

This study used SmartPLS 4 to empirically examine the hypotheses that were put forth. SmartPLS 4 was chosen because it provides superior results and can handle both simple and complex/large research models without requiring a normality test (Bamgbade et al., 2015; Hair Jr et al., 2021). Moreover, previous research indicates that the Partial Least Squares Structural Equation Modeling (PLS-SEM), when compared to covariance-based approaches, frequently yields superior findings (Afthanorhan, 2013; Hair Jr et al., 2021). Therefore, two models were estimated in PLS-SEM: the structural model and the measurement model, both of which were utilized in this study. Additionally, descriptive statistical analysis was conducted using SPSS (Version 27) software.

4. Data Analysis and Results

To understand the demographic profile of the survey participants, an analysis focused on key factors such as gender, age, educational attainment, and frequency of online shopping was conducted. Table 1 illustrates the outcomes of this analysis. Among the 375 final respondents, 88.0% were female and 12.0% were male. The largest proportion of respondents, totaling 71.2%, were aged between 20 and

30 years. Furthermore, those holding a bachelor's degree constituted the largest segment of the sample, making up 61.8% of the respondents.

Table 1: Demographic Characteristics of the Respondents ($N = 375$)

Demographic Variables		Category	Frequency	Percent (%)
1.	Gender	Male	45	12.0
		Female	330	88.0
2.	Age	20-30 years	267	71.2
		31-40 years	89	23.7
		41-50 years	19	5.1
3.	Educational Level	High School	21	5.6
		Bachelor's degree	232	61.8
		Master's degree	122	32.6
		or higher		
4.	Frequency of online shopping	Daily several times	11	3.0
		Daily once	155	41.3
		Weekly once	92	24.5
		Monthly once	117	31.2

Moreover, the study utilized SmartPLS 4 to conduct analysis in two stages: the measurement model and the structural model. In the measurement model, three essential aspects were calculated: content validity, convergent validity, and discriminant validity (Hair Jr et al., 2013).

Content validity ensures that the loadings of each variable's items are higher than those of other variables in the same rows and columns. In this study, content validity was assessed using factor loadings, which are presented in Table 2, following the guidance of prior researchers (Chin, 1998; Hair Jr et al., 2021). All items of respective variables demonstrated high loadings compared to other variables.

Convergent validity assesses the extent to which items of a variable measure the same underlying construct (Rehman et al., 2019). It ensures that all items effectively reflect their corresponding indicators (Zhou et al., 2013). Essentially, convergent validity indicates how well a predictor correlates positively with other predictors of the same construct (Hair Jr et al., 2021). In structural equation modeling (SEM), three criteria: factor loadings, composite reliability (CR), and average variance extracted (AVE) are crucial for evaluating convergent validity (Fornell & Larcker, 1981). Specifically, factor loadings should exceed 0.50, and both AVE and CR should be at least 0.50 and 0.70, respectively (Hayduk & Littvay, 2012). Items with factor loadings above these standardized values contribute to a robust theoretical framework. Additionally, Cronbach's alpha, which should surpass 0.60 (Nunnally, 1978), also met the requisite standards as shown in Table 2. Thus, this research confirmed the convergent validity criteria of its theoretical framework (Bagozzi and Yi, 1988).

Table 2: Reliability Analysis

Variables	Items	LS	CE	PT	PC	OSB	AVE	CR	CA	R ²	Rho_A
LS	LS1	0.882					0.795	0.940	0.914		0.918
	LS2	0.863									
	LS3	0.909									
	LS4	0.913									
CE	CE1		0.863				0.846	0.956	0.939		0.945
	CE2		0.932								
	CE3		0.939								
	CE4		0.943								

PT	PT1	0.931	0.877	0.966	0.953	0.462	0.954
	PT2	0.931					
	PT3	0.952					
	PT4	0.932					
PC	PC1	0.907	0.855	0.946	0.915		0.915
	PC2	0.937					
	PC3	0.930					
OSB	OSB1	0.902	0.809	0.971	0.966	0.695	0.968
	OSB2	0.885					
	OSB3	0.797					
	OSB4	0.930					
	OSB5	0.913					
	OSB6	0.918					
	OSB7	0.916					
	OSB8	0.928					

Discriminant validity refers to the situation where researchers ensure that each indicator within a theoretical framework is statistically distinct (Rehman et al., 2019). It indicates whether two variables are statistically different from each other, demonstrating the extent to which one variable is empirically distinguishable from others (Hair Jr et al., 2021). Specifically, items belonging to a particular variable should exhibit greater variance compared to items of other variables within the theoretical model. In this study, discriminant validity was assessed following the guidelines of Fornell and Larcker (1981) and through the Heterotrait-Monotrait ratio (Hair Jr et al., 2013). According to these criteria, comparisons were made between the diagonal upper values (derived from the square root of AVE) and values below them. For each column and row, the diagonal upper value should exceed the corresponding below values. Table 3 demonstrates that the standardized criteria for discriminant validity were met in this research.

Table 3: Validity Analysis

Variables	CE	LS	OSB	PC	PT
CE	0.920				
LS	0.657	0.892			
OSB	0.559	0.654	0.899		
PC	0.544	0.574	0.804	0.924	
PT	0.586	0.644	0.713	0.688	0.936

Table 4: Heterotrait-Monotrait ratio (HTMT)

Variables	CE	LS	OSB	PC	PT
CE					
LS	0.704				
OSB	0.584	0.694			
PC	0.585	0.627	0.854		
PT	0.617	0.687	0.743	0.737	
PC x PT	0.146	0.251	0.294	0.327	0.362

In the initial phase, we establish the prerequisites for the measurement or outer models, including content validity, discriminant validity, convergent validity, and reliability. Moving forward, this section focuses on testing the hypotheses proposed earlier using two methods in SmartPLS 4. Firstly, the

Algorithm technique is applied, followed by the Bootstrapping technique. As illustrated in Fig. 2 and detailed in Table 5, our study comprises nine hypotheses, encompassing six direct hypotheses and three indirect hypotheses involving mediation and moderation.

In this study, our focus is on assessing the predictive relevance of the theoretical model through three key metrics: R-squared (R^2), standardized root mean square residual (SRMR), and Stone–Test Geisser (Q^2). R^2 signifies the proportion of variance explained by all independent constructs. According to Cohen (1988), R^2 values between 0.02 and 0.13 are considered weak, 0.13 to 0.26 moderate, and above 0.26 substantial. In our research, the R^2 values for PT and OSB are deemed substantial. SRMR measures the disagreement between the implied correlation matrix in the model and the observed correlations (Browne and Cudeck, 1992). The SRMR value obtained, 0.037, falls below the maximum threshold of 0.080 as recommended by Hu and Bentler (1999). Additionally, cross-validated redundancy is evaluated to gauge the quality of the research model using the blindfolding technique in SmartPLS. Q^2 , which assesses predictive relevance, should exceed zero (Chin, 1998a; Henseler et al., 2009). In our study, the Q^2 value of 0.558 surpasses zero, indicating good predictive relevance of the model according to Hair Jr et al. (2021).

Table 5: PLS Bootstrapping Results

Hypotheses Paths	Std. Beta	Std. Dev	T values	p values	Results	VIF	SRMR	²
H1a LS -> PT	0.456	0.061	7.455	p<0.001 (0.000)	Accept	1.759		
	0.139	0.032	4.306					
H1b LS -> OSB				p<0.001 (0.000)	Accept	1.759	0.037	.558
H2a CE -> PT	0.286	0.067	4.256	p<0.001 (0.000)	Accept	1.918		
H2b CE -> OSB	0.087	0.027	3.249	p<0.01 (0.001)	Accept	1.977		
H3 PT -> OSB	0.305	0.054	5.662	p<0.001 (0.000)	Accept	1.155		
H4	0.139	0.032	4.306					
LS -> PT -> OSB				p<0.001 (0.000)	Accept			
H5 CE -> PT -> OSB	0.087	0.027	3.249	p<0.01 (0.001)	Accept			
H6 PC -> OSB	0.596	0.052	11.356	P<0.001 (0.000)	Accept			
H7 PC x PT -> OSB	0.005	0.029	0.162	p>0.05 (0.871)	Reject			

***p < 0.001, **p < 0.01, and *p < 0.05

For direct relationship hypotheses, all six hypotheses were supported while indirect hypotheses exhibited support for two out of three. For example, live streaming (LS) has a significant and positive influence on promotional tools (PT) as (β value 0.456, t value 7.455, and $p < 0.001$). Also, live streaming (LS) has a significant and positive influence on online shopping behavior (OSB) as (β value 0.139, t value 4.306, and $p < 0.001$). Moreover, celebrity endorsement (CE) has a significant and positive influence on PT as ($\beta = 0.286$, $t = 4.256$, $p < 0.001$). Besides, celebrity endorsement (CE) has a significant and positive influence on OSB as ($\beta = 0.087$, $t = 3.249$, $p < 0.01$). Furthermore, promotional tools (PT) have a positive and significant influence on OSB as beta value = 0.305, t value = 5.662, and a p value less than 0.001. Meanwhile, perceived credibility (PC) has a positive and significant influence on OSB as β value 0.596, t value 11.356, and $p < 0.001$. In addition, PT significantly and positively mediates the relationship between LS ($\beta = 0.139$, $t = 4.306$, $p < 0.001$), and OSB. Moreover, PT significantly and positively mediates the relationship between CE ($\beta = 0.087$, $t = 3.249$, $p < 0.01$), and OSB. However, PC did not moderate the relationship between PT and OSB as ($\beta = 0.005$, $t = 0.162$, $p > 0.05$). In this respect, only one hypothesis H7 is not accepted (Table 5).

5. Discussion and Conclusion

This research investigates the factors influencing consumer online shopping behavior in social commerce, emphasizing the moderating influence of perceived credibility. The study proposed a research model consisting of eleven hypotheses. As detailed earlier, Hypotheses 1a, 1b, 2a, 2b, 3, 4, 5, and 6 found support, while Hypothesis 7 did not. Nevertheless, the study model successfully explained 69.5% of the variance in consumer online shopping behavior.

The hypotheses were categorized into two groups, focusing on direct effects on consumer online shopping behavior. The empirical results indicated that live streaming, celebrity endorsement, promotional tools, and perceived credibility all have positive influences on consumer online shopping behavior. The findings strongly support the idea that live streaming positively affects consumer online shopping behavior, contradicting previous research, particularly in the field of social commerce (e.g., Miah et al., 2022). Therefore, businesses can enhance their sales by engaging in live streaming sessions that allow direct interaction with consumers.

Additionally, celebrity endorsement was found to positively impact consumer online shopping behavior, consistent with previous literature (e.g., Miah et al., 2022). This suggests that products endorsed by celebrities tend to attract more consumer interest, making this strategy advantageous for businesses to pursue.

Moreover, the positive effect of promotional tools on consumer online shopping behavior suggests that products advertised through social media promotional tools are more likely to be purchased by consumers. Furthermore, perceived credibility was observed to positively influence consumer online shopping behavior, indicating that consumers are more inclined to purchase products from businesses they perceive as credible.

The second set of hypotheses explored the mediating role of promotional tools and the moderating role of perceived credibility. Results showed support for two out of three hypotheses in this group. The findings demonstrated that promotional tools significantly mediate two specific relationships: i.e., amid live streaming and consumer online shopping behavior, and between celebrity endorsement and consumer online shopping behavior. This underscores the importance of promotional tools in influencing consumer online shopping behavior, particularly in the contexts involving live streaming and celebrity endorsement. However, the study did not find substantial evidence to support the idea that perceived credibility moderates the relationship between promotional tools and consumer online shopping behavior.

6. Implications

6.1 Theoretical Implications

This study contributes significantly to the theoretical understanding of consumer online shopping behavior, particularly in the context of the social commerce. It stands out as one of the few research endeavors that delve into the determinants influencing consumer online shopping behavior, especially within the specific context of Indonesia. Moreover, the research innovatively explores the mediating role of promotional tools in the relationship between live streaming, celebrity endorsement and consumer online shopping behavior. In addition, the moderating influence of perceived credibility on the relationship between promotional tools and consumer online shopping behavior is another contribution of this study. Furthermore, another significant theoretical contribution of this study is its expansion of the Social Influence Theory (SIT).

6.2 Practical Implications

This study delves into the increased usage of social commerce by Indonesian consumers, highlighting the importance for providers to understand consumer online shopping behavior dynamics. It emphasizes the significance of factors such as live streaming, celebrity endorsement, promotional tools and perceived credibility in fostering consumer online shopping behavior. Notably, the research underscores the direct positive impact of live streaming and celebrity endorsement, suggesting that improving these aspects can naturally enhance consumer online shopping behavior. This underscores the importance of focusing on these determinants for sustained consumer online shopping behavior and relationship building in the social commerce industry.

Besides, the study underscores the importance of promotional tools in fostering consumer online shopping behavior. Customers are more inclined to shop through social media platforms in the long run if they find them beneficial, while also perceiving added benefits compared to other methods. Businesses should prioritize to use social media marketing tools to attract more customers in Indonesian social commerce platforms. Additionally, this research highlights significant role of perceived credibility in bolstering consumer online shopping behavior, particularly in the realm of social commerce.

Furthermore, the study reveals that social media marketing tools mediates the association amid live streaming, celebrity endorsement and consumer online shopping behavior. Thus, live streaming sessions, celebrity endorsement and advertising it through social media marketing tools can help business to reach more customers and boosting up their sales performance.

7. Limitations and Future Research Directions

This study acknowledges few limitations that suggest directions for future research. Firstly, its applicability is constrained by its focus on Indonesia, highlighting the necessity for cross-cultural validation in diverse settings. Secondly, exploring additional constructs like product involvement and hedonic motivations could enhance understanding of their direct impacts on consumer online shopping behavior. While perceived credibility was examined as a moderator, future investigations could consider other moderators such as demographics and consumer habits. Furthermore, exploring mediators and their interrelationships could add complexity to the research model. Moreover, expanding beyond the social commerce sector to investigate consumer online shopping behavior across various industries (e.g., fashion) could yield valuable insights. Longitudinal studies could also offer a more comprehensive understanding of consumer online shopping behavior over time. Lastly, future studies could benefit from larger sample sizes to improve the robustness and reliability of their findings.

Data Availability

The data supporting the findings of this study is available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare no conflicts of interest.

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